

COMPRESSOR WITH UNLOADER VALVE BETWEEN ECONOMIZER LINE AND EVAPORATOR INLET

ABSTRACT OF THE DISCLOSURE

A compressor has an economizer injection line communicating into the compressor compression chambers. An unloader valve selectively communicates the economizer injection line back to a point upstream of the evaporator. When the compressor is run in unloaded mode, partially compressed refrigerant is thus returned to a point upstream of the evaporator. In unloaded mode, this results in a higher refrigerant mass flow through the evaporator, as compared to prior art where the bypassed refrigerant was returned downstream of the evaporator. This increases system efficiency by more effectively returning oil which otherwise might be left in the evaporator back to the compressor. Also, the amount of refrigerant superheat entering the compressor in unloaded operation is reduced as compared to the prior art compressor systems, wherein the bypassed refrigerant is returned directly to the compressor suction line. Reduced refrigerant superheat increases system efficiency, improves motor performance and reduces compressor discharge temperature.